10537560

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Search Report

Database Name	Database Number
TULSA-SUBSCRIBERS	987
GEOREF	89

Set	Description
S1	(((coherent OR swell) AND noise) AND filter? AND (frequency(1N)space))/ti,ab,DE
S2	RD
S3	SORT /ALL/py,d

☑ 1 **PROCESSING SEISMIC DATA TO REMOVE SWELL NOISE** -
Author (Inventor): ZEROUK, K -
Patent Assignee: WESTERNGECO SEIS HOLD LTD -
Patent Information: Gr. Brit. 2,396,013A, p. 6/9/2004, f. 12/4/2002 (Appl. 0,228,260) (G01V-001/36). (27 pp; 17 claims) -
Patent (Number, Date): GB 2396013 A, 20040609 -
Application (Number, Date): GB 0228260 , 20021204 - Petroleum Abstracts No. 844025 - 2004 -
IPC Code: G01V-001/36 -
Language: ENGLISH -
Document Type: PATENT -
Record Type: ABSTRACT -

Abstract: A method for processing seismic data that contains both a desired signal and swell noise caused by wave action on the receiver is described. The method is applicable to seismic data in the frequency-space domain, and comprises determining a signal-only prediction filter from the seismic data at a first frequency at which swell noise is not present and applying the prediction filter to seismic data at a second frequency at which swell noise is present. This attenuates swell noise in the seismic data at the second frequency. - TULSA (Petroleum Abstracts)

☑ 2 **PROCESSING SEISMIC DATA** -
Author (Inventor): ZEROUK, K -
Patent Assignee: WESTERNGECO SEIS HOLD LTD -
Patent Information: World 04/051,315A1, p. 6/17/2004, f. 12/3/2003, pr. Gr. Brit. 12/4/2002 (Appl. 0,228,260) (G01V-001/36). (30 pp; 17 claims) -
Patent (Number, Date): WO 04/051315 A1, 20040617 -
Application (Number, Date): WO, 20031203 -
Priority (Number, Date): GB 0228260 , 20021204 - Petroleum Abstracts No. 844023 - 2004 -
IPC Code: G01V-001/36 -
Language: ENGLISH -
Document Type: PATENT -
Record Type: ABSTRACT -

Abstract: A method for processing seismic data that contains both a desired signal and swell noise is described. The method is applicable to seismic data, is in the frequency-space domain method, and comprises determining a signal-only prediction filter from the seismic data at a first frequency at which swell noise is not present, and applying the prediction filter to seismic data at a second frequency at which swell noise is present. This attenuates swell noise in the seismic data at the second frequency. In one version, the prediction filter for a

frequency fL, the lowest frequency at which swell noise is present, is determined from seismic data at frequency fH+1, where fH is the highest frequency at which swell noise is present. The prediction filter for a frequency fL+1 is determined from seismic data at frequency fH+2, etc., so that the prediction filter for frequency fH+1 is determined from seismic data at frequency f2H-L+1. - TULSA (Petroleum Abstracts)

☑ 3 **METHOD OF ATTENUATING NOISE IN THREE DIMENSIONAL SEISMIC DATA USING A PROJECTION FILTER** -
Author (Inventor): FERBER, R; OZBEK, A; OZDEMIR, A K; ZEROUK, K -
Patent Assignee: SCHLUMBERGER CANADA LTD; SCHLUMBERGER HOLDINGS LTD; SCHLUMBERGER SERV PETROL -
Patent Information: World 00/42,448, p. 7/20/2000, f. 1/12/2000, pr. Gr. Brit. 1/14/1999 (Appl. 9,900,723) (G01V-001/36). (50 pp; 8 claims) -
Patent (Number, Date): WO 00/42448 , 20000720 -
Application (Number, Date): WO, 20000112 -
Priority (Number, Date): GB 9900723 , 19990114 - Petroleum Abstracts No. 749372 - 2000 -
IPC Code: G01V-001/36 -
Language: ENGLISH -
Document Type: PATENT -
Record Type: ABSTRACT -

Abstract: A method of attenuating noise in 3-dimensional seismic data using a projection algorithm is described. A frequency-space-space (f-xy) projection algorithm is used which is a generalization of the f-x projection algorithm. The predictability of the seismic signals in the f-xy domain constitutes the basis of the algorithm. Specifically, it is demonstrated that if the seismic events are planar in the t-xy domain, then in the f-xy domain they consist of predictable signals in the xy-plane for each frequency f. A crucial step of the 2-D spectral factorization is achieved through the helical coordinate transformation. In addition to the disclosed general algorithm for arbitrary coherent noise, a specialized algorithm for random noise is described. It has been found that the disclosed projection algorithm is effective even in extreme cases of poor signal-to-noise ratio. The algorithm is also signal preserving when the predictability assumptions hold. - TULSA (Petroleum Abstracts)

☑ 4 **COHERENT NOISE ATTENUATION BY ADAPTIVE FILTERING AND BEAMFORMING** -
OZBEK, A -
SCHLUMBERGER -
62ND EAGE CONF. (Glasgow, Scotland, 5/29/2000-6/2/2000) EXTENDED ABSTR. v.1, pap. no.L-22, 2000. (ISBN 90-73781-12-4; Also available on CD-ROM; 4 pp; 8 refs) - Petroleum Abstracts No. 748753 - 2000 -
ISBN: 9073781124 -
Language: ENGLISH -
Document Type: MEETING PAPER ABSTRACT -
Record Type: ABSTRACT -

Abstract: Two classes of adaptive signal processing methods to attenuate coherent noise in seismic data are introduced. These multichannel methods have been designed to attenuate dispersive and nonstationary coherent noise in the presence of phase and amplitude perturbations. The first method, named ACONA, can be classified as a multichannel adaptive interference canceller that is applicable to both single and multicomponent data that may be aliased. In contrast to adaptive interference cancellers in general, a signal-free noise reference is not readily available in seismic data acquisition. Various preprocessing techniques are introduced to generate the coherent noise reference channels. The second method is called LACONA, which is a linearly constrained adaptive beamformer implemented as a multi-channel adaptive filter bank. The objective in its design was to preserve signals incident from a range of target directions, while suppressing interferences incident from other directions. LACONA can be thought of as an adaptive f-k filter that is adaptive in those parts of the frequency-wavenumber space that contain noise, but fixed in the regions of the f-k space that contain the signal to be preserved. (Longer abstract available) - TULSA (Petroleum Abstracts)

☑ 5 **ADAPTIVE BEAMFORMING WITH GENERALIZED LINEAR CONSTRAINTS** -
OZBEK, A -
SCHLUMBERGER -
70TH ANNU. SEG INT. MTG. (Calgary, Canada, 8/6-11/2000) EXPANDED ABSTR. BIOGR. v.2, pp.2081-2084, 2000. (ISSN 1052-3812; Pap. no.SP 6-3; 4 refs) - Petroleum Abstracts No. 745380 - 2000 -

ISSN: 10523812 -
Language: ENGLISH -
Document Type: MEETING PAPER ABSTRACT -
Record Type: ABSTRACT -

Abstract: A new adaptive beamforming approach to attenuate the various types of coherent noise encountered in seismic data acquisition and processing is introduced. It is applicable to data recorded using both linear and areal arrays. The receivers can be either evenly or unevenly spaced. The method can be thought of as an adaptive f-k filter that is adaptive in those parts of the frequency-wavenumber space that contain noise, but fixed in the regions of the f-k space that contain the signal to be preserved. Seismic signals with arbitrary, but prespecified spectral content in the frequency-wavenumber domain are passed, while coherent noise and interference components that are temporally and spatially nonstationary are adaptively filtered. A generalized constraint design methodology is utilized which allows the imposition of an arbitrary predesigned quiescent response on the beamformer. The quiescent response is the response of the beamformer in the presence of spatial and temporal white noise. (Longer abstract available) - TULSA (Petroleum Abstracts)

☑ 6 **AMPLITUDE-PRESERVED SUBTRACTION OF MULTIPLE EVENTS** -
SPITZ, S -
CGG AMERICAS INC -
32ND ANNU. SPE ET AL. OFFSHORE TECHNOL. CONF. (Houston, TX, 5/1-4/2000) PROC. v.1, pp.279-282, 2000. (OTC-12046; 3 refs) - Petroleum Abstracts No. 732716 - 2000 -
Report: OTC-12046 -
Language: ENGLISH -
Document Type: MEETING PAPER TEXT -
Record Type: ABSTRACT -

Abstract: Any technique aimed at subtracting the multiple wavefield from the seismic data can be seen as a 2-step process. In the first step the multiple events are predicted. In the second step, the predicted wavefield is subtracted from the input data. A new approach is proposed to the subtraction of the predicted multiple events. This approach is based on the spatial predictability of the coherent events in the frequency-space (or time-space) domain. Unlike the standard attenuation techniques, this new approach is able to subtract the coherent noise even in the presence of strong cross talk between the signal and the multiple components of the input data. - TULSA (Petroleum Abstracts)

☑ 7 **Application of wavelet transform in reflection seismic data analysis** -
Miao, Xiao-Gui; Moon, Wooil M. -
University of Manitoba, Department of Geophysics, Winnipeg, MB, Canada - ; Seoul National University, South Korea -
Publisher: Hanrimwon Publishing Company for the Geological Society of Korea, Seoul, South Korea - Geoscience Journal (Seoul) - , Volume: 3 - , Number: 3 - , Page: 171-179 - GeoRef No. 00-016391 - September 1999 -
Country Of Publication: South Korea -
ISSN: 1226-4806 -
Document Type: Serial -
Bibliographic Level: Analytic -
Illustrations: illus. -
Language: English -

Abstract: A seismic signal is characterized by its travel time, frequency and phase information, as well as noises, especially coherent noises. The wavelet decomposition of a seismic signal involves simultaneous representation of its time and frequency characteristics. The key advantage of the wavelet transform (WT) over the conventional Fourier transform is that it can not only provide insight on the combined temporal and spectral characteristics of signals, but it can also localize the target information in the time-frequency domain simultaneously. The wavelet transform distinguished itself from the short time Fourier transform for time-frequency analysis in that it has a zoom-in and zoom-out capability. Thus the WT approach is suitable for time-frequency analysis of seismic signals. Application capability of the wavelet transform depends on the selection of the wavelet functions from which a basis function can be constructed for signal decomposition. There are two types of wavelet functions: orthogonal and non-orthogonal wavelet functions, thus the algorithms of the

wavelet transform vary. The commonly used wavelet functions are orthonormal and compactly supported, but do not have a finite impulse response and linear phase. These features are, however, undesirable for applications in exploration seismology, especially when further subsequent processing is required in complex domain. Compactly supported non-orthogonal wavelets do not have phase distortion problem and provide a better choice for seismic data processing. Reflection and refraction events, coherent noises such as ground roll, air-wave, and ringing in seismic data have characteristic features and can be distinguished in the time-frequency space. The Morlet wavelet, a well-known example of non-orthogonal wavelets, is tested in this study for effectively suppressing coherent noise. It was also demonstrated that the reconstructed signals after the weighted wavelet transform show significant improvements in the S/N ratio. (21 Refs.) - GeoRef

☑ 8 **ADAPTIVE SEISMIC NOISE AND INTERFERENCE ATTENUATION METHOD** -
Author (Inventor): OZBEK, A -
Patent Assignee: SCHLUMBERGER CANADA LTD; SCHLUMBERGER HOLDINGS LTD; SCHLUMBERGER SERV PETROL -
Patent Information: World 99/60,423, p. 11/25/1999, f. 5/18/1999, pr. Gr. Brit. 5/20/1998 (Appl. 9,810,708) (G01V-001/36). (55 pp; 19 claims) -
Patent (Number, Date): WO 99/60423 , 19991125 -
Application (Number, Date): WO, 19990518 -
Priority (Number, Date): GB 9810708 , 19980520 - Petroleum Abstracts No. 726001 - 1999 -
IPC Code: G01V-001/36 -
Language: ENGLISH -
Document Type: PATENT -
Record Type: ABSTRACT -

Abstract: A method relating to filtering coherent noise and interference from seismic data by constrained adaptive beamforming is described using a constraint design methodology which allows the imposition of an arbitrary predesigned quiescent response on the beamformer. The method also makes sure that the beamformer response in selected regions of the frequency-wavenumber space is entirely controlled by this quiescent response, hence ensuring signal preservation and robustness to perturbations. Built-in regularization brings an additional degree of robustness. Seismic signals with arbitrary spectral content in the frequency-wavenumber domain are preserved, while coherent noise and interference that is temporally and spatially nonstationary is adaptively filtered. The approach is applicable to attenuation of all types of coherent noise in seismic data including swell noise, bulge-wave noise, ground-roll, air wave, seismic vessel and rig interference, etc. It is applicable to both linear or areal arrays. - TULSA (Petroleum Abstracts)

☑ 9 **Application of 2-D wavelet transform in coherent noise elimination** -
Gao Zhenshan; Li Qinxue; Wang Xinjun; Liu Cai; Zhang Haijiang -
Daqing Company of Geophysical Prospecting, Daqing, China - ; Changchun University of Science and Technology, China -
Publisher: Changchun College of Geology, Beijing, China -
Changchun Keji Daxue Xuebao = Journal of Changchun University of Science and Technology - , *Volume: 28* - , *Number: 4* - , *Page: 433-437* - GeoRef No. 02-007836 - October 1998 -
Country Of Publication: China -
Coden: #02201 -
ISSN: 1008-0058 -
Document Type: Serial -
Bibliographic Level: Analytic -
Illustrations: illus. -
Language: Chinese - **Summary Language:** English -

Abstract: Coherent noise often makes the reflection events in the seismic record ambiguous, and affect processing and interpretation. Our technique is to fully utilize 2-D wavelet transform, map 2-D data to a four-dimensional space about time, frequency, space and wavenumber. According to localized differences between signal and noise in the four-dimensional space, we can effectively filter the noise. (3 Refs.) - GeoRef

☑ 10 **ANALYSIS OF A SEISMIC RECORD IN THE FREQUENCY-WAVENUMBER DOMAIN** -
ISMAIL, M A -
AIN SHAMS UNIV -
ACTA GEOPHYS. POL. v.46, no.3, pp.325-350, 1998. (ISSN 0001-5725; 30 refs) - Petroleum Abstracts No.

715200 - 1998 -
ISSN: 00015725 -
Language: ENGLISH -
Document Type: JOURNAL ARTICLE -
Record Type: ABSTRACT -

Abstract: Multidomain frequency-wavenumber (F-K) filtering has been developed to reduce the complex coherent noise and to solve problems inherent in the application of F-K filtering to down-dip seismic data that can occur in both land and marine data. The noises can be classified into coherent and uncoherent, multiples, ground roll and acoustic waves. The Fast Fourier Transform is used 2 times to segregate a seismic record into 2 different half planes of frequency-wavenumber space (F-K) on the traveling direction of the events. Apparent-velocity filters can be designed to remove a noise wedge rather than to pass a signal wedge, with a filter called butterfly. For ideal processing, fine spatial sampling during the original recording is required. This technique is applied to vertical seismic profile and surface seismic data. Three field examples were selected from varying locations to explain how the F-K processing may be used. - TULSA (Petroleum Abstracts)

☑ 11 **APPLICATION OF WAVELET TRANSFORM AND SIGNAL RECONSTRUCTION IN SURFACE WAVE ELIMINATION** -
DU, S; LUO, G -
GEOPHYSICAL RESEARCH INST -
OIL GEOPHYS. PROSPECTING v.31, no.3, pp.337-349, 6/15/96. (ISSN 1000-7210; 14 refs; In Chinese) - Petroleum Abstracts No. 645152 - 1996 -
ISSN: 10007210 -
Language: CHINESE -
Document Type: JOURNAL ARTICLE -
Record Type: ABSTRACT -

Abstract: The surface wave is a noise wave existing commonly in seismic data. Its elimination is very difficult in data processing. Usual filtering methods eliminate surface waves, but damage useful signals which coexist with the surface wave in the same frequency band. On the basis of the fact that surface wave energy is stronger than reflection energy in the low frequency range, and on the assumption that surface wave energy varies slowly in small frequency and space ranges, a new method is proposed. On the basis of frequency-band decomposition of the wavelet transform, a linear time shift of the surface wave is achieved by using its apparent velocity, making surface wave intertrace-coherent. The surface wave is abstracted by making a KL decomposition or doing wavelet transform in the x-axis direction, which is then subtracted from the original seismic data. Synthetic and real data processing results show that the method can desirably eliminate surface waves, without damage to low-frequency reflection data. - TULSA (Petroleum Abstracts)

☑ 12 **PRESTACK COHERENT-NOISE SUPPRESSION OF 3D DATA IN THE F-X DOMAIN** -
GAISER, J E -
WESTERN GEOPHYSICAL -
58TH EAGE CONF. (Amsterdam, Neth, 6/3-7/96) EXTENDED ABSTR. v.1, pap. no.B005, 1996. (ISBN 90-73781-07-8; 2 pp; 5 refs; Abstract only) - Petroleum Abstracts No. 637112 - 1996 -
ISBN: 9073781078 -
Language: ENGLISH -
Document Type: MEETING PAPER ABSTRACT -
Record Type: ABSTRACT -

Abstract: Shot-generated coherent noise, in the form of dispersive surface waves and trapped modes, is a significant problem corrupting seismic data. Although many acquisition and processing techniques are successful in suppressing such noise for conventional 2-D data, these methods are often ineffective for the 3-D case. 2-D data spatially samples the seismic wavefield in a regular manner along a single direction. Thus, inline receiver arrays and frequency-wavenumber (f-k) or Radon transform (t-p) filtering methods are effective in reducing coherent noise. However, for 3-D data, signal and noise arrive at receivers from a wide range of azimuths. Therefore, receiver arrays may be impractical, and in any given propagation direction the wavefield is not uniformly sampled, precluding the straight forward use of f-k or t-p filters. An approach to coherent-noise suppression for 3-D data is presented that addresses the issues of irregular spatial sampling and

noise variability. Using frequency-space (f-x) domain fan filters and a least-squares optimization scheme, noise is locally estimated at each receiver for a specified range of apparent velocities and then subtracted from the data. (Longer abstract available) (Original article not available from T.U.) - TULSA (Petroleum Abstracts)

☑ 13 **3-D PRESTACK f-x COHERENT NOISE SUPPRESSION** -
GAISER, J E -
WESTERN GEOPHYSICAL CO -
65TH ANNU. SEG INT. MTG. (Houston, 10/8-13/95) EXPANDED TECH. PROGRAM ABSTR. BIOGR. pp.1354-1357, 1995. (ISSN 1052-3812; Pap. no.SP1.6; 5 refs; Abstract only) - Petroleum Abstracts No. 615923 - 1995 -
ISSN: 10523812 -
Language: ENGLISH -
Document Type: MEETING PAPER ABSTRACT -
Record Type: ABSTRACT -

Abstract: Shot-generated coherent noise that originates at the near surface has long been a significant problem and often corrupts seismic data. Although many acquisition and processing techniques are successful in suppressing this type of noise for conventional 2-D data, such methods are often ineffective for the 3-D case. This presentation discusses an approach to coherent-noise suppression for 3-D shot data that addresses issues of irregular spatial sampling and noise variability with offset and azimuth. Using frequency-space domain fan filters and a least-squares approach, noise is estimated for a specified range of apparent velocities and subtracted from the data. Comparison of this method with a frequency-wavenumber filter on 2-D synthetic data shows nearly identical responses. A 3-D field shot record is used to illustrate the effectiveness and robustness of this methodology. (Longer abstract available) (Original article not available from T.U.) - TULSA (Petroleum Abstracts)

☑ 14 **F-X FILTERS WITH DIP REJECTION** -
WANG, W; WEST, G -
TORONTO UNIV -
61ST ANNU. SEG INT. MTG. (Houston, 11/10-14/91) EXPANDED TECH. PROGRAM ABSTR. BIOGR. v.2, pp.1436-1438, 1991. (ISSN 1052-3812; Pap. no.SP5.3; 4 refs; Abstract only) - Petroleum Abstracts No. 519499 - 1991 -
ISSN: 10523812 -
Language: ENGLISH -
Document Type: MEETING PAPER ABSTRACT -
Record Type: ABSTRACT -

Abstract: The F-X prediction filter is a technique to reduce random noise in the frequency-space domain. It is now widely used due to its property of enhancing coherent signal at any angle without generation of artifacts. However, it may also enhance coherent noise at the same time. Especially when used in common-shot gathers to improve the low ratio of signal to noise of prestack data, it can make surface waves stronger. A new F-X filter is designed which suppresses both random noise and specified coherent noise. An example on a NMO (normal moveout) corrected shot gather shows the data are dramatically improved. (Longer abstract available) (Original article not available from T.U.) - TULSA (Petroleum Abstracts)
